AMENDMENTS TO THE SPECIFICATION:

Please replace the paragraph beginning at page 8 line 16, with the following amended paragraph:

The structure shown in FIG. 1(a) is composed of an assymetrical cross of covered microchannels 1, 2 that can be connected to external tubes at positions 4, 5, 6 and 7. In the longer channel 1 (5cm), a conductivity detector 8 can be inserted to detect the injected plugs. The structure shown in FIG. 1(b) ~~is composed of~~ comprises four ~~channels 4-3, 5-3, 6-3 and 7-3~~ symmetrical arms of equal length (1.1 cm) ~~with symmetrical arms~~ that can contain electrodes 8 for detection or for voltage application purposes. The arms extend from intersection 3 respectively to openings at positions 4, 5, 6, and 7, and may thus be referred to for convenience as arms 4-3, 5-3, 6-3, and 7-3. Arms will be designated in a similar manner subsequently in this specification.

Please replace the paragraph beginning at page 9 line 1, with the following amended paragraph:

Four inlet reservoirs of the micro-channel network, at positions 4, 5, 6 and 7, were connected to a two-way micro-8-port valve with the configuration shown in Fig. 2(a) allowing injection and elution of the sample. The 8-port micro-valve was connected to syringe pumps with a flow rate range of

between 0.01 to 1000 $\mu \cdot l \cdot h^{-1}$ which are connected to the micro-channel.

Please replace the paragraph beginning at page 9 line 9, with the following amended paragraph:

The first method necessitates the use of two solutions (running buffer and sample solution) that are pumped independently inside the structure. On one position of the valve (see Figure 2 (a)) the running buffer is pumped from one ~~inlet~~ opening at position 5, which serves as an inlet, to one ~~outlet~~ opening at position 7, which serves as an outlet, whereas both side arms ~~4-3, 6-3 of the structures~~ 4-3 and 6-3 i.e., the arm extending from intersection 3 to the opening at position 4 and the arm extending from intersection 3 to the opening at position 6, are connected together as a loop. In this case, the running solution is pumped linearly throughout the structure. At a given time, the multiport valve is switched to the second position represented by Figure 2 (b), where the sample enters from side arm 4-3, whereas this time no flow is entering the main channel 1. During this time, a plug is formed at the intersection 3. The multiport valve is then placed on the first position (Fig. 2a), where the running buffer drives the sample in the intersection 3 into the main channel 1 towards the outlet opening at position 7 or a detector.

Please replace the paragraph beginning at page 10 line 23, with the following amended paragraph:

C) The micro-8-port valve is then put back to Position A. As a result, the eluent pushes the sample plug into the main channel 1 towards the channel outlet at position 7 or a detector 8.

Please replace the paragraph beginning at page 12 line 27, with the following amended paragraph:

First, the running buffer must be connected directly to the structure, without going through the multi-port valve as presented in Figure 5. This means that the same pressure is applied to an inlet formed by the opening at position 5 during the injection as well as during the separation. The other tubes are connected as presented in Figure 5 (a), where a pressure is applied from three channel openings at positions 4, 5 and 7 towards the intersection 3 and where one single channel opening, at position 6, is connected to the waste. The pressure in the channels can be adjusted to get a symmetric or an asymmetric injection pattern that will generate a bigger or a smaller plug. In this regard the size of the syringes 9 can be the same or of different sizes in order to obtain a symmetrical or an asymmetrical triangle shape. When the multi-port valve is switched to the position shown in Figure 5 (b), the running buffer direction is linear and brings a plug 10 with it through the main channel 1. The channel openings at positions 4 and 6 are connected together and therefore, the net flow in the second channel 2 is very low. Compression of the solution induces a push back effect in the second channel 2, allowing the injection of a small and

very well defined plug 10. The solution is then pushed and the plug 10 transforms to a parabolic shape with respect to the flow rate. This type of injection is suited to any kind of solution and is not limited to the conductivity or surface properties of the material used for the structure.